cess in demonstrating the practicability of a measure hitherto believed impossible of accomplishment. The greater portion of the foregoing data was furnished by Captain E. P. Bertholf of the *Bear*.

The result of Mr. Thurber's experiment is to establish the possibility of feeding fur-seals in captivity. Incidential to this is the interesting disclosure seemingly demonstrated by three examples under observation that the frenum in the fur-seal young at first opposes an obstacle to their taking solid food, and that its rupture is a prerequisite to their feeding on other substances than mother's milk. Should this be proved by subsequent experimentation, the knowledge may open up a wide field of endeavor, having as its object the saving from death of those fur-seal nurslings whose mothers have been killed at sea, and which now die a lingering death from starvation.

BARTON W. EVERMANN,
WALTER I. LEMBKEY
BUREAU OF FISHERIES,
WASHINGTON, D. C.

SOCIETIES AND ACADEMIES

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 462d meeting was held November 27, 1909, with President Palmer in the chair.

Mr. A. S. Hitchcock referred to the many changes in nomenclature in recent years, and pointed out that much of this change was inevitable. He illustrated the changes that must follow from increased knowledge of the history of grasses, by examples from Otto Kuntze and showed how some of Kuntze's conclusions were nullified by an early paper by Rafinesque.

Professor Bartsch, referring to a recent paper by Professor Spillman, called attention to the attempts of Mr. D. H. Talbot, of Sioux City, Iowa, during the eighties to breed a solid-hoofed hog in order to overcome the foot disease. Hog cholera carried off all but two of the selected animals which had only partially solid hoofs. From the progeny of these by selection and breeding a race of solid-hoofed hogs was obtained, specimens of which were seen by the speaker in the early nineties.

The chair called attention to the consummation of what may be considered the first international game preserve. This preserve consists of two separate reservations—one established by the state of Minnesota and the other by the province of Ontario. These two reservations adjoin the international boundary. For several years a bill to establish a game refuge in northern Minnesota has been pending in Congress but has failed to pass. Last February by proclamation of the President the Superior National Forest was established in Minnesota, and shortly after a bill was passed by the state legislature prohibiting the hunting of game animals or birds in national forests, state parks and such other lands in the state of Minnesota as the game commission might set aside as game refuges. Under this law the Superior State Game Preserve, comprising about 1,000,000 acres, and including all of the Superior National Forest and some other lands adjoining the international boundary, has recently been established. Still more recently the province of Ontario has set aside an equal area as the Quetico National Forest immediately adjoining the Minnesota reservation on the north. The combined area of the two reservations is about 2,000,000 acres.

Mr. Howell described a case of semi-domestication of a wild bird, the myrtle warbler, in the drug store of Union Station at Washington. Mr. H. W. Clark noted a somewhat similar instance at Lake Maxinkuckee, Ind., in 1906.

The following communications were presented:

Observations on the Mammals of the Mammoth Cave: A. H. HOWELL.

The paper gave the results of a visit to the cave in late June and early July. The habits of the cave rat (*Neotoma pennsylvanica*) were described and specimens exhibited which had been captured in the cave. Mention was made of the occurrence of three species of bats in the cave in winter; none is found there, however, during the summer months.

The Distribution of Color in the Seeds of Cowpeas: C. V. PIPER.

In the seeds of cowpeas, the following colors are met with where the seed is uniformly colored: black (really very dark violet), violet, maroon, pink, buff, cream, white, marbled brown and buff, speckled blue on buff. In many varieties of cowpeas, however, especially where the body is white, the other color is always distributed in definite types: (1) *Small-eyed* with a small amount of color about the hilum. (2) *Large-eyed* with a large amount of color about the hilum. (3) *Saddled* with a very large amount of color cen-

tering about the hilum. (4) Like (2) or (3), but the color extending over the strophiolar end of the seed. (5) Like (4), but in addition scattered isolated spots. (6) The whole seed colored excepting a small area at the micropylar end. These types of distribution are identical for all the colors, and in this respect the marbled and speckled colors act like simple colors; for example, a cross between whippoorwill, a marbled seed and black eye gives a white seed with a marbled coloring about the eye. It is evident from what hybridizing has been done and the varieties already in existence that there are perfectly definite factors determining the color distribution, the exact details of which will require much further investigation. It is suggestive that the coloring centers about the eye and in the different types extends farther and farther morphologically from the eye, the last part of the seed remaining white being the micropylar end. This is apparently in accordance with the path of nutrient substances entering the seed as the micropylar end is both morphologically and physiologically farthest from the hilum. The distribution of color in the cowpea is much simpler and quite different from what it is in the beans, which have been more carefully studied. In the case of some cowpea hybrids, one color pattern seems to be laid directly over the other as in crosses between marbled and speckled varieties, which results in hybrids having both the marbling and the speckling.

A Painful Skin Disease in Man Caused by a Predaceous and Supposedly Beneficial Mite: F. M. WEBSTER.

Attention was called to epidemics of a dermatitis due to a small mite (*Pediculoides ventricosus*) in various parts of the country. In the east, the presence of these mites among wheat straw was traced to the abundance of the larvæ of the Angoumois grain moth, while in the middle west, its excessive abundance was due to the presence of a wheat joint worm (*Isosoma tritici*).

As wheat straw is used largely in the manufacture of a cheap grade of mattresses, people using these mattresses had experienced painful eruption caused by the mites escaping from the straw and attacking the occupants of the beds on which the mattresses were used. In the middle west, people handling wheat straw, either in thrashing the grain or in bales, had been attacked and suffered from the attacks of the mites. Owing to the fact that this eruptive skin disorder affected whole families, it has been heretofore supposed to be contagious.

M. C. MARSH,
Recording Secretary

THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON

AT the 436th regular meeting of the society, held in University Hall, George Washington University, November 9, 1909, Dr. Edgar L. Hewett, director of the American School of the Archæological Institute of America, gave an account of the work of the school during the past years. The lecture was illustrated with stereopticon views. Dr. Hewett first described and illustrated the work of the Utah Branch, in immediate charge of Professor Byron Cummings, of the State University of Utah. He threw on the screen views of the large natural bridge and of the two great cliff houses lately discovered on the Navajo National Monument, northern Arizona. Archeological work is now being done on the ruins on this reservation. He showed also the method of work and the results obtained in excavations conducted by the American School at Puye and Rito de los Frijoles, in New Mexico. Excavations at the former place included work on the large community house on the mesa, and on the cliff-dwelling at the base of the cliff. He explained the relation of the casas and the rooms built on top of the talus in front of them.

"The ancient remains of the Rito," said Dr. Hewett, "consist of four community houses in the valley and one on the mesa rim near the southern limit of the cañon, and a series of cliff houses extending for a distance of a mile and a quarter along the base of the northern wall." The excavation at the Rito revealed a type of ruin called a talus village; thirteen of these ruins were recognized.

The field work of the school includes not only excavation of ruins, but also repair of their walls and in some minor cases restoration.

Views were shown of the community house on top of the mesa at the Rito, the trail worn to the summit, an excavated kiva, a restored ceremonial opening, a secular room provided with a fireplace and another with a mill (restored) for grinding corn. It is contemplated to place in the excavated rooms the more common domestic articles found in them, so that in a field museum of this kind these may be viewed in their proper setting.

AT the 437th regular meeting, December 7, 1909, Dr. J. B. Clayton gave an illustrated lecture on "Varying Values of the Cross Symbol."

In common with other universal symbols the cross emblem presents four clearly marked stages in its development, a simple idea, elaboration, sanctity and decadence. The crux ansata of Egypt, which was originally a water gauge beginning with a simple stick set upright on the banks of the Nile to indicate the height of the annual overflow, was elaborated, first, by the addition of a short horizontal bar, thus forming a tau-cross, the masculine symbol sacred in Phœnicia to Tammuz, and later by the sun-circle, finally changed to a loop, making the object a handled cross. Thus juxtaposed, the fertility of sun and waters suggest the generative powers of nature. This symbol appears in the catacombs with the sun circle transformed into a laurel wreath, expressive of the triumphant faith and hope of christians. The first historical appearance of the swastika, fourteenth (?) century B.C., is apparently on a small leaden figure three and a half inches long, found by Dr. Schliemann in the second city of the ruins of Troy together with many crosses of gold, silver, etc., the location of the symbol on the figure having generative significance. The swastika indicated the sun—the feet referring to the rays, then fire and finally life. In India, the swastika (arani) formed by the two firesticks—the feet indicating flames—was the emblem of fire, then, by an association of ideas, the flame of being. Thor's hammer, identical in form with the Phœnician masculine cross, was the sacred symbol of fire, the hearth, marriage and fertility, and in the god's use of this hammer to restore his two dead goats, the symbol suggests immortality. The paper traced the gathering of various national crosses by the early converts to the catacombs of Rome, where the crux ansata, swastika, tau-cross and modifications of them all, appear on the walls and tombs. The wave of enthusiasm occasioned by the discovery of America brought many missionaries across the Atlantic—following the reports of those who took possession of the soil under the sign of the cross—and they were amazed to find the cross already so prevalent, attributing its presence to some early christian missionary, traditionally St. Thomas. Its use on altars, tablets and pottery, in weaving, in ceremonies, as well as in representing the orientation of the earth and the heavens, the material and the invisible world, were suggested in support of the thesis that whether as swastika, emblem of fire, wind or water, crux ansata emblem of reproduction, the tau-cross suggestive of the masculine function, or the Latin cross with its acquired ethical suggestion, the cross has always been the generic symbol of the impartation and maintenance of life.

John R. Swanton,
Secretary

The Botanical Society of Washington

The fifty-seventh meeting of the society was held at the Dewey Hotel, November 26, at eight o'clock P.M., Vice-president Spillman presiding. The following papers were read.

Maize and Pellagra: Dr. C. L. Alsberg.

A description of the clinical features of pellagra was presented, its history in Europe sketched and its occurrence in North and South America discussed. The different hypotheses in regard to its etiology were considered, viz., the malnutrition theory, the spoiled maize theory and the work of Lombroso, the mold theory and the work of Ceni, the bacterial theory, and the protozoon theory. It may be said that pellagra occurs where spoiled corn forms the most important feature of the diet of wretchedly poor peasantry, that most investigators believe it to be an intoxication by as yet unidentified toxic products of the growth of lower organisms upon corn, and that this belief has not as yet been established beyond doubt. In the United States sporadic cases have probably existed for many years. Its apparent increase of recent years may, if the spoiled corn theory be correct, be due to climatic and agricultural changes leading to change in varieties of corn grown, to harvesting of more immature corn, and to imperfect curing, all factors which may favor spoiling. The industrialization of the south with the resultant consumption of corn shipped long distances and the disappearance of the small neighborhood grist mill, may be further factors. Deterioration of corn is usually due to its great moisture content, when harvested prematurely or imperfectly cured. The remedy is to cause it to be thoroughly dried, preferably in kilns, before it leaves the farmer. This would not merely be an important hygienic measure but an equally important economic one. The saving of freight charges would be enormous, for many millions of gallons of water in the form of unnecessary moisture are hauled annually from the corn-belt to the seaboard.

The Relation of Plants to Peat Formation: Professor Charles A. Davis.

A short account of two important types of peat deposits and ecological relations of the plants from which they are formed.

The chief agents of decomposition of vegetable

matter are aerobic organisms, principally plants; anaerobic forms being much less active and seemingly wanting in many peat beds. Over most of the United States, peat is formed only where the ground-water level is above or very near the soil surface, because it is only through saturation that the air and the more actively destructive organisms are excluded and vegetable accumulations partially preserved. The numbers and kinds of anaerobic organisms and the decomposition resulting from their activities seem also to be reduced by the presence of gases like hydrogen sulphide and methane and of colloidal and soluble poisonous substances resulting from the decomposition in progress. Most peat beds show a much greater amount of decomposition above the water level than below it.

The two types of peat deposits discussed were those formed (1) in depressions below the ground-water level, ponds and lakes; (2) where the soil surface was at or slightly above the ground-water level, poorly drained flat areas.

In (1) the major part of the material is laid down under water through the growth of aquatic plants. These are primarily governed in the depth to which they can grow below the water surface by the distance to which enough light can penetrate for the minimum requirement to enable them to establish themselves. Few species reach twenty feet even in clear water, and this is reduced by any suspended or dissolved colored matter. Peat formation is slow at maximum depths at which plants grow, and more rapid in shallower water—hence the deposits often take the form of terraces, with steep outer faces. The peat at different depths is chiefly or wholly formed by definite plant associations that arrange themselves zonally around the open water, according to their tolerance of poor light, low temperature and other unfavorable conditions. Free-floating plants of all types may form additions to any part of deposits or make up a large part of any given one.

When the surface of the accumulated débris rises nearly to the level of the water, turf-forming plants may invade it and form a permanent cover. Shrubs, coniferous trees and sphagnum moss may establish themselves when the surface is about a foot above the permanent water level, and the latter may then build up the deposit for a few feet. The sphagnum-covered peat bed is more common at the north than in the south, where shrub and tree-covered deposits are more common.

The plants that form peat beds on flat areas are those able to endure excess of water, and probably toxic substances about their roots. Those found in a particular locality will depend on the permanent relation of the ground-water level to the soil surface, and may be mosses, sedges, grasses, shrubs or trees, or mixtures of all these. If the water level rises as the peat accumulates, as seems often to happen, the same plant associations may form the entire deposit. If the peat builds faster than the water level rises, the significant plants will change until a forest association is developed.

If the water level rises faster than the peat, pond conditions may be developed. In any case, peat beds will be of homogeneous structure only where the water level rises with the peat, and it is only on such deposits that the plant association growing on the surface is significant of the structure and quality of the peat below.

W. W. STOCKBERGER,
Corresponding Secretary

THE TORREY BOTANICAL CLUB

THE meeting of October 27, 1909, was held at the New York Botanical Garden and was called to order at 3:30 P.M. by Dr. E. B. Southwick.

About forty persons were present. After the reading of the minutes of the preceding meeting, the scientific program was presented, the first contribution being made by Mrs. N. L. Britton, who spoke on "Arctic Mosses." The speaker's remarks were based on studies of mosses sent from the American Museum of Natural History to the New York Botanical Garden for determination. They were collected by Commander Robert E. Peary in Grant Land in 1902, and by Dr. L. J. Wolf at Wrangle Bay, Lincoln Bay and Grant Land in 1906. The Peary collection includes 62 bryophytes, of which 57 were mosses, representing 24 genera, and 5 were hepatics.

Specimens of flowering plants were also exhibited which have recently been acquired by the New York Botanical Garden through the courtesy of the Peary Arctic Club from the American Museum of Natural History.

The collection consists of herbarium specimens made on the late expedition of Commander Peary to the North Pole and were collected mostly by Dr. J. W. Goodsell. While some of these were obtained on the northern coast of Labrador, the majority were collected on Grant Land, in the northern portion of Ellesmere Land, an island off the coast of Greenland. One of the packages contained specimens from perhaps the most northern

locality where flowering plants have ever been found, while another is from Etah, the most northern habitation of man.

Since the subject of mosses was the principal topic of the hour, Dr. Murrill referred briefly to the genus *Dictyolus*, the species of which are found on living mosses. This genus belongs to the Chanterleæ, a tribe of gill-fungi, and there are only two species known in North America, *D. muscigenus*, occurring from Greenland to South Carolina, and *D. retirugus*, known from Greenland, Alaska, Minnesota and California. Both species are small and thin, grayish or brownish in color and have folded-like gills. *D. muscigenus* may be recognized by its distinct stipe and dichotomous gills, while *D. retirugus* is sessile or subsessile with branched, reticulate gills.

Dr. N. L. Britton spoke of the three genera of Cactaceæ, *Carnegiea*, *Pachycereus* and *Cephalocereus*, and showed specimens of their flowers. The genus *Carnegiea*, dedicated to Mr. Andrew Carnegie and formerly known as *Cereus giganteus*, consists of a single species. Some of these plants attain a height of sixty feet and branch at from twelve to twenty feet above the ground. The flowers are funnelform with a nearly cylindric tube, bearing a few broad triangular scales. *Pachycereus* blooms at a different season from *Carnegiea* and the perianth tube is clothed with woolly hairs and bristles.

Cephalocereus, which has many representatives in the West Indies and some in Mexico, derives its name from the fact that the top of the plant is hairy. At Key West, Florida, there is a colony of *Cephalocereus keyenses* which is related to some of the Cuban and Bahaman species. It is the only locality where this species is known to exist. As it is growing here on a government reservation, it will most likely be preserved.

Mr. Roland M. Harper told of his experiences in the south from July, 1908, to July, 1909. A few weeks were spent at the Biltmore Forest School, North Carolina. Specimens were observed here of *Helonias bullata* and *Dalibarda repens* which are not listed in Small's "Flora of the southeastern United States." The former was reported several years ago by F. E. Boynton, while the latter was first noticed by Dr. Homer D. House.

Six weeks were spent in Georgia, particularly in the vicinity of Pine Mountains and among the sand-hills of the fall line region, where he found *Chamæcyparis thyoides* which has not previously been reported from the state. Specimens of *Chrysopsis pinifolia*, discovered by Elliott in 1815, and known only from one county, were collected, and also a twining *Bartonia*. Together with a party of geologists, Mr. Harper made a trip of 260 miles on the Warrior and Tombigbee rivers in Alabama, which occupied a period of ten days. Here he collected an *Equisetum* which resembles *E. arvense*, but is several hundred miles out of the range of that species. While in Florida studying peat for the state geological survey, he found several interesting plants, *Spartina Bakeri*, which is very common but not mentioned in any flora, and an arborescent *Serenoa serrulata*, some plants of which attained a height of ten feet, and an undescribed species of *Prunus*. Mr. Harper explored the southern end of the everglades, following about the same route as that taken by Dr. Britton in 1904 and Dr. Small in January of this year.

Dr. Southwick reported the finding of *Viola pedata* in flower, October 25.

The meeting of November 9, 1909, was held at the American Museum of Natural History with Vice-president Barnhart in the chair. Eighty-nine persons were present.

The scientific program of the evening consisted of a talk by Dr. Marshall A. Howe on "Some Floral and Scenic Features of Porto Rico." This was a semi-popular account of some of the more striking features of the native and introduced flora of the island and was illustrated by about a hundred lantern slides, some of which showed, incidentally, many interesting topographic and scenic details of the Porto Rican mountains and sea-coast. Special attention was given to the native palms and their economic uses. The photographs shown included, also, several of the cacti, which are much in evidence in certain places along the southern shore of Porto Rico and on the adjacent island of Culebra. In striking contrast with the xerophytic vegetation of the southern slopes are the mesophytic forests, now, unhappily, of very limited extent, on two or three of the highest mountains. The soil of the island is or has been very nearly all under cultivation, but in addition to the two or three comparatively small forested areas there are, here and there, in various parts of the island, rocky hills where the native vegetation may be found under very nearly natural conditions. The sugar, coffee and tobacco industries were also discussed and illustrated by the speaker.

Percy Wilson,
Secretary